

A Revision of the Japanese Spiders of the Genus *Langbiana* (Araneae, Zodariidae)

By

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日本産ハウシグモ属（クモ目，ハウシグモ科）の検討

The Zodariidae comprise peculiar myrmecophilous spiders and consist of about 300 known species in the world. Of these, about 130 were described mainly from the Palearctic and Australian Regions under the single and well-known genus *Storena* WALCKENAER, 1805. Though the spiders of this genus are commonly found under stones and dead leaves in the tropical forests, classification of the spiders has been left unstudied. Recently, BOSMANS and VAN HOVE (1986) revised the species described as *Storena* from the world and concluded that most of them should be transferred from the original genus to *Langbiana* HOGG, 1922, a genus very little known after its original description from Annam.

Only one representative of the genus "*Storena*" was previously described from Japan, that is, *Storena hoosi* KISHIDA, 1935. However, the species has never been systematically scrutinized, because the type specimen seems to have been lost like the types of other species of his. On the other hand, occurrence of some undescribed species of the genus in the Ryukyu Islands, Southwest Japan, has been reported by many authors (OI, 1963 a, b; SHIMOJANA, 1963, 1966, 1967; YAGINUMA, 1964, 1970; SAKAGUCHI, 1970; IKEHARA & SHIMOJANA, 1971; OKUBO, 1973; TANIKAWA, 1989).

In the course of the Natural History Researches on the Amami and the Tokara Islands made by the National Science Museum, Tokyo (1988–1989), the authors obtained a specimen of an interesting zodariid spider from Amami-ôshima Island. Its study led them to a revision of the Japanese species of the genus *Langbiana*. Thus, *Storena hoosi* will be redescribed on the basis of the neotype designated herewith and transferred to *Langbiana*, and three species will be newly described from the Ryukyu Islands.

All the type specimens designated in the present paper are deposited in the collection of the National Science Museum (Nat. Hist.), Tokyo.

Before going further, the authors wish to express their sincere thanks to Dr. Shun-Ichi UENO,

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Family Zodariidae SIMON, 1890

Genus *Langbiana* HOGG, 1922, sensu BOSMANS and VAN HOVE

Langbiana HOGG, 1922, Proc. zool. Soc. Lond., 1922, p. 286. — BOSMANS & VAN HOVE, 1986, Bull. Brit. arachnol. Soc., 7, p. 20.

Storena: KISHIDA, 1935, Kishû Dôshokubutsu, Shirahama, 2 (2), p. 3. — YAGINUMA, 1954, Atypus, Osaka, (7), p. 19; 1960, Spid. Japan Col., Osaka, p. 82; 1968, *ibid.* (rev. ed.), p. 82; 1986, *ibid.* (n. ed.), p. 126. (Nec *Storena* WALCKENAER, 1805.)

Other literatures are omitted; for synonymies see BONNET (1958) and BOSMANS and VAN HOVE (1986).

Type species. Langbiana klossi HOGG, 1922, Proc. zool. Soc. Lond., 1922, p. 286; by monotypy. Female holotype from Dalat, Langbian Mountains, 5,000 ft., South Annam, spring of 1918, C. BODEN KLOSS leg., probably in the collection of the British Museum (Nat. Hist.), London, not examined.

Notes. Diagnosis and detailed description of the genus were given by BOSMANS and VAN HOVE (1986). The generic name was derived from Lang Bian Mountains near Da Lat in southern Vietnam.

Four species are known from Japan.

Key to the Japanese Species of *Langbiana*

- 1(2) Dorsum of opisthosoma with some pairs of white spots (Fig. 26); main duct of embolus much longer than embolic apophysis (Fig. 23), tip of median apophysis (tegular apophysis) pointed (Fig. 22); spermathecae close to each other (Fig. 25) *L. shimojanai* sp. nov.
- 2(1) Dorsum of opisthosoma without paired spots; main duct of embolus nearly as long as embolic apophysis, tip of median apophysis simple or bent; both the sides of spermathecae relatively distant from each other.
- 3(4) Dorsum of opisthosoma without distinct markings, uniformly black (Fig. 13), legs reddish yellow; main duct of embolus slightly shorter than embolic apophysis (Fig. 17), tip of median apophysis simple (Fig. 16); epigynal plate strongly procurved (Fig. 18). *L. fulvipes* sp. nov.
- 4(3) Dorsum of opisthosoma with distinct markings; legs not reddish; epigynal plate straight.
- 5(6) Dorsum of opisthosoma with wide, white median band (Fig. 2); main duct of embolus slightly longer than embolic apophysis (Fig. 7), median apophysis with small bent tip (Fig. 6); spermathecae distant from each other by twice the diameter of one of them (Fig. 9) *L. hoosi* (KISHIDA, 1935), comb. nov.

- 6(5) Dorsum of opisthosoma with Δ -shaped white marking in the anterior part (Fig. 12); spermathecae distant from each other by 1.5 times the diameter of one of them (Fig. 11); male unknown *L. sadamotoi* sp. nov.

***Langbiana hoosi* (KISHIDA, 1935), comb. nov.**

(Figs. 1-9)

Storena hoosi KISHIDA, 1935, Kishû Dôshokubutsu, Shirahama, 2 (2), p. 1 (female holotype from Kagoshima Pref., Japan, lost; neotype designated in the present paper). — YAGINUMA, 1954, Atypus, Osaka, (7), p. 19; 1960, Spid. Japan Col., Osaka, p. 82; 1968, *ibid.* (rev. ed.), p. 82; 1986, *ibid.* (n. ed.), p. 126. — ISHINODA, 1969, Atypus, Osaka, (49/50), p. 71. — ISHINODA & TSUKIJI, 1969, Kirishimayama Sôgôchôsa Hôkokusho, p. 292. — BEPPU, 1971, Spid. Fauna Kagoshima Pref., p. 24. — SHINKAI & TAKANO, 1984, Field Guide Spid. Japan, p. 120. — CHIKUNI, 1989, Pictor. Encycl. Spid. Japan, pp. 97, 228.

Type specimen. Neotype: ♀, Kirishima-jingû, Kirishima-chô, Aira-gun, Kagoshima Pref., Japan, 20-VIII-1989, A. TANIKAWA leg. (NSMT-Ar 2201).

Other specimens examined. 2 ♀♀, same data as for the neotype, H. ONO leg. (NSMT-Ar 2202); 2 ♀♀, Kagoshima-jingû, Hayato-chô, Aira-gun, Kagoshima Pref., Japan, 23-VIII-1989, A. TANIKAWA leg. (NSMT-Ar 2203); 4 ♀♀ 1 ♀ juv. 2 ♂ juv., Imuta, Kedôin-chô, Satsuma-gun, Kagoshima Pref., 21-VIII-1989, H. ONO leg. (NSMT-Ar 2204); 1 ♀, same locality and same date, A. TANIKAWA leg. (NSMT-Ar 2205); 1 ♂, same locality, became adult on 28-X-1989 after



Fig. 1. *Langbiana hoosi* (KISHIDA, 1935), female. (Photo: E. SHINKAI.)

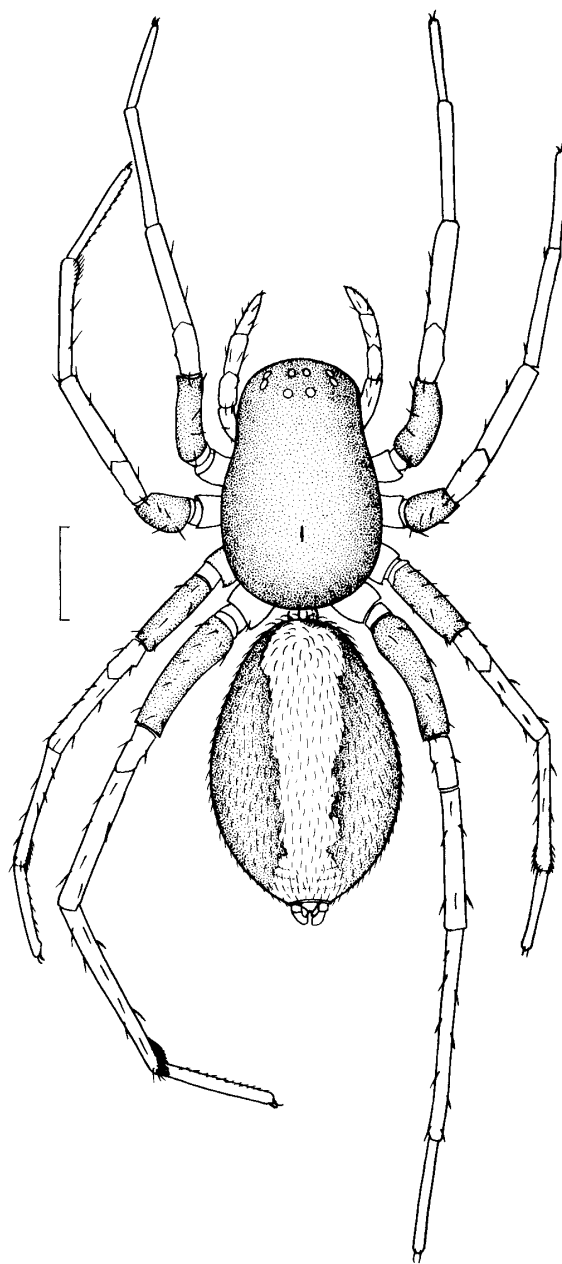
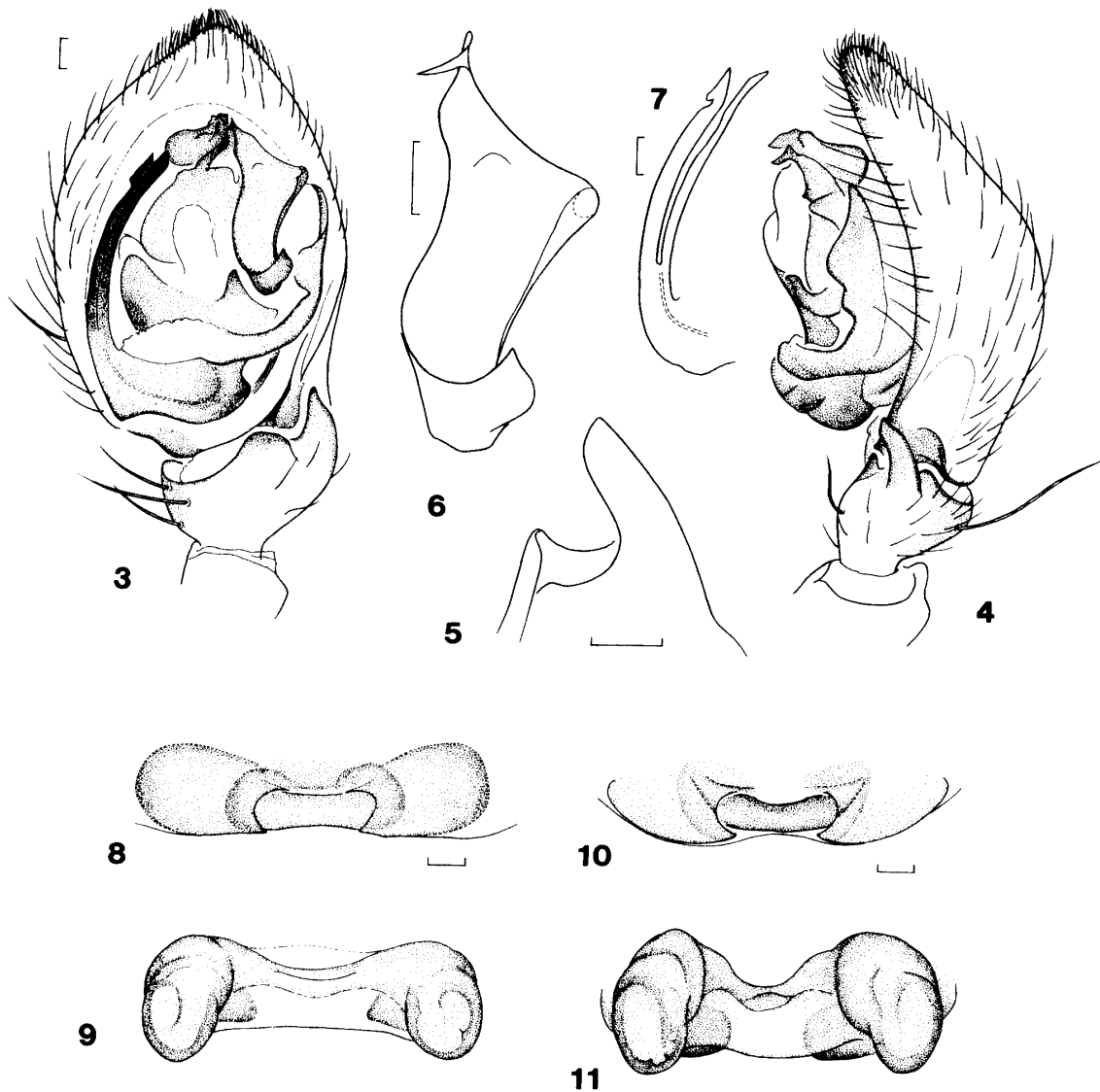


Fig. 2. *Langbiana hoosi* (KISHIDA, 1935), habitus of female. (Scale: 1 mm.)

breeding, S. INABA leg. (NSMT-Ar 2206); 1 ♀, Shiratori-jinja, Ebino-shi, Miyazaki Pref., 21-VIII-1989, A. TANIKAWA leg. (NSMT-Ar 2207).

Redescription. Measurements (in mm). Body length ♀ 6.70–9.60, ♂ 6.44; prosoma length ♀ 3.62–4.48, ♂ 3.28, width ♀ 2.42–3.03, ♂ 2.33; opisthosoma length ♀ 3.12–4.85, ♂ 2.89, width ♀ 2.48–3.55, ♂ 2.11; lengths of legs in the neotype (♀) and 1 ♂ from Imuta [total length (femur + patella + tibia + metatarsus + tarsus)] : ♀ I 8.62 (2.30 + 0.99 + 1.87 + 1.88 + 1.58), II 8.05



Figs. 3-11. 3-9, *Langbiana hoosi* (KISHIDA, 1935); 10-11, *L. sadamotoi* sp. nov. — 3, Male palp, ventral view; 4, same, retrolateral view; 5, retrolateral tibial apophysis; 6, median apophysis; 7, embolus; 8 & 10, epigyna; 9 & 11, female genitalia, dorsal view. (Scales: 0.1 mm.)

(2.20+0.99+1.60+1.84+1.42), III 8.13 (2.14+0.98+1.60+2.10+1.31), IV 10.44 (2.60+0.97+2.20+3.00+1.67), ♂ I 7.71 (2.15+0.89+1.63+1.63+1.41), II 7.43 (2.07+0.89+1.44+1.70+1.33), III 7.41 (1.96+0.93+1.41+1.85+1.26), IV 9.44 (2.59+0.81+1.96+2.52+1.56).

Eyes*: ALE/AME ♀ 1.00-1.17, ♂ 1.00, PME/AME ♀ 0.92-1.08, ♂ 1.11, PLE/AME ♀ 1.08-1.17, ♂ 1.33, AME-AME/AME-ALE ♀ 0.27-0.42, ♂ 0.56, PME-PME/PME-PLP ♀ 0.36-0.47, ♂ 0.64, MOA length/width ♀ 1.06-1.12, ♂ 1.00, anterior width / posterior width ♀ 0.82-0.88, ♂ 0.67. Labium length/width ♀ 0.92-1.05, ♂ 0.85; sternum length / width ♀ 1.02-1.07, ♂ 1.04.

*The abbreviations used in this paper: ALE, anterior lateral eye; AME, anterior median eye; PLE, posterior lateral eye; PME, posterior median eye; MOA, median ocular area.

Male palp (Figs. 3-7). Retrolateral tibial apophysis digitiform (Fig. 5); median apophysis (tegular apophysis) large, the tip bent (Fig. 6), embolus with developed apophysis, the main duct slightly longer than embolic apophysis (Fig. 7).

Female genitalia (Figs. 8-9). Spermathecae distant from each other by twice the diameter of a spermatheca. Epigynal plate straight.

Coloration and markings (Figs. 1-2). ♀♂: Prosoma dark chestnut without any markings; chelicerae brown or dark chestnut, labium brown, distally lighter, maxillae dark yellow or yellowish brown, sternum brown; femora of legs and palps distally dark grey, the other parts of legs and palps yellow to light yellowish brown. Opisthosoma black with wide median band white to cream.

Range. Kyushu (Kagoshima and Miyazaki Pref.). YAGINUMA (1970) recorded this species from Shikoku. The present authors were unable to examine any specimens of this species collected from outside southern Kyushu.

Remarks. The median apophysis of the male palp of this species resembles that of *Langbiana martensi* (ONO, 1983), comb. nov., described from Nepal, but the latter has paired white spots on the opisthosoma. This species can be readily distinguished from the other Japanese species by having wide median band on the opisthosoma.

***Langbiana sadamotoi* sp. nov.**

(Figs. 10-12)

Type specimen. Holotype: ♀, Mt. Yuwan-dake, 630 m alt., Amami-ôshima Island, Kagoshima Pref., Southwest Japan, 24-VIII-1989, M. SADAMOTO, A. TANIKAWA and H. ONO leg. (NSMT-Ar 2208).

Description based on the female holotype; male unknown. **Measurements** (in mm). Body length 7.11; prosoma length 3.33, width 2.28; opisthosoma length 3.28, width 2.28; lengths of legs [total length (femur + patella + tibia + metatarsus + tarsus)] : I 8.94 (2.37+0.96+2.07+2.02+1.52), II 8.11 (2.15+0.96+1.70+1.93+1.37), III 8.22 (2.15+0.96+1.70+2.22+1.19), IV 10.96 (2.78+0.96+2.37+3.22+1.63).

Eyes: ALE/AME 1.08, PME/AME 1.00, PLE/AME 1.17, AME-AME/AME-ALE 0.58, PME-PME/PME-PLE 0.50, MOA length/width 1.18, anterior width / posterior width 0.94. Labium length/width 1.00; sternum length/width 1.08.

Female genitalia (Figs. 10-11). Spermathecae distant from each other by 1.5 times the diameter of spermatheca. Epigynal plate straight.

Coloration and markings (Figs. 12). Prosoma dark chestnut brown; chelicerae, maxillae and sternum brown, labium brown, distally yellow; legs and palps light yellowish brown except for femora distally blackish brown. Opisthosoma blackish brown with white markings, venter yellowish brown.

Range. Known only from the type locality.

Remarks. This new species seems to be related to *L. hoosi* and *L. fulvipes* sp. nov., but can be distinguished from these species by the shape of female genitalia and the markings of opisthosoma as given in the key.

This new species is dedicated to Mr. Miyoshi SADAMOTO, Tokyo.

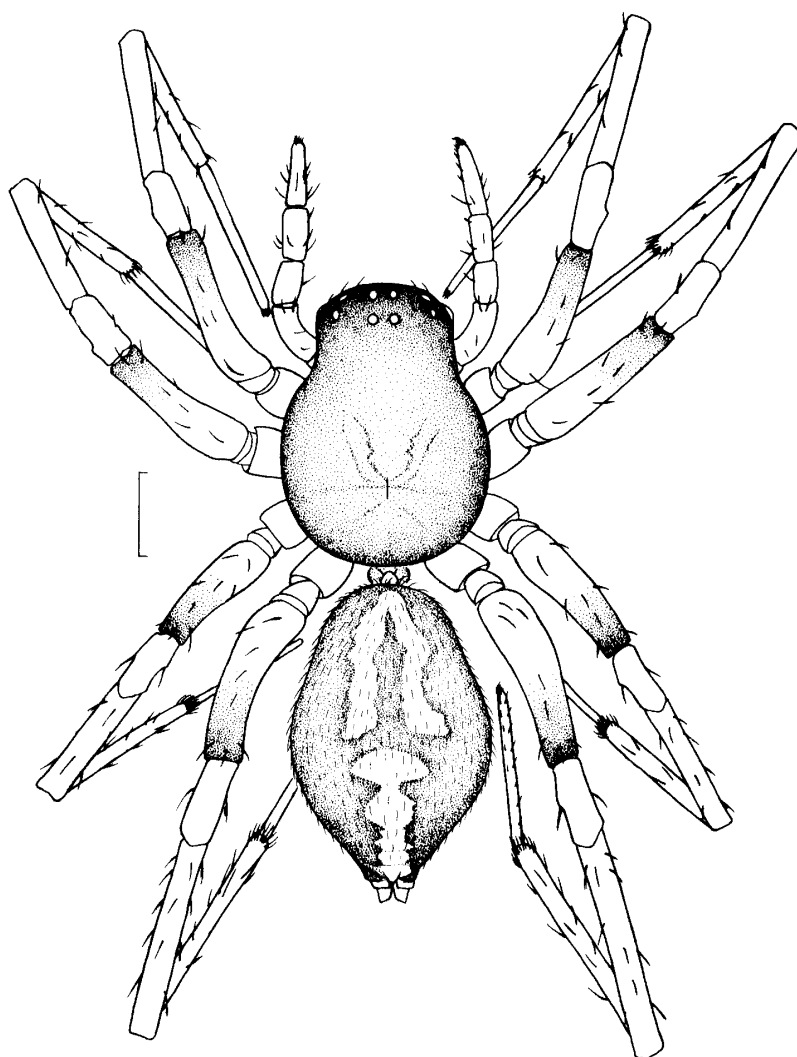


Fig. 12. *Langbiana sadamotoi* sp. nov., habitus of female. (Scale: 1 mm.)

***Langbiana fulvipes* sp. nov.**

(Figs. 13-19)

Type series. Holotype: ♂, allotype: ♀, Ôtomi, Iriomotejima Island, Yaeyama Islands, Southwest Japan, 12-VIII-1985, A. TANIKAWA leg. (NSMT-Ar 2209-2210). Paratypes: 1 ♀, same locality as for the holotype, 3-I-1988; 1 ♀, Shirahama, Iriomotejima Island, 23-VIII-1988; 1 ♀ 1 ♂, Komi, Iriomotejima Island, 4-I-1988; 1 ♂, same locality, 29-III-1988; 2 ♂♂, same locality, 22-VIII-1988, all the paratypes collected by A. TANIKAWA.

Description. Measurement (in mm). Body length ♀ 6.20-8.55, ♂ 6.03-6.70, prosoma length ♀ 3.30-4.00, ♂ 3.40-3.80, width ♀ 2.18-2.65, ♂ 2.44-2.62; opisthosoma length ♀ 2.73-4.60, ♂ 2.50-3.00, width ♀ 2.02-3.20, ♂ 1.97-2.08; lengths of legs of the holotype and allotype [total length (femur + patella + tibia + metatarsus + tarsus)] : ♀ I 8.21 (2.31+0.96+1.78+1.75+

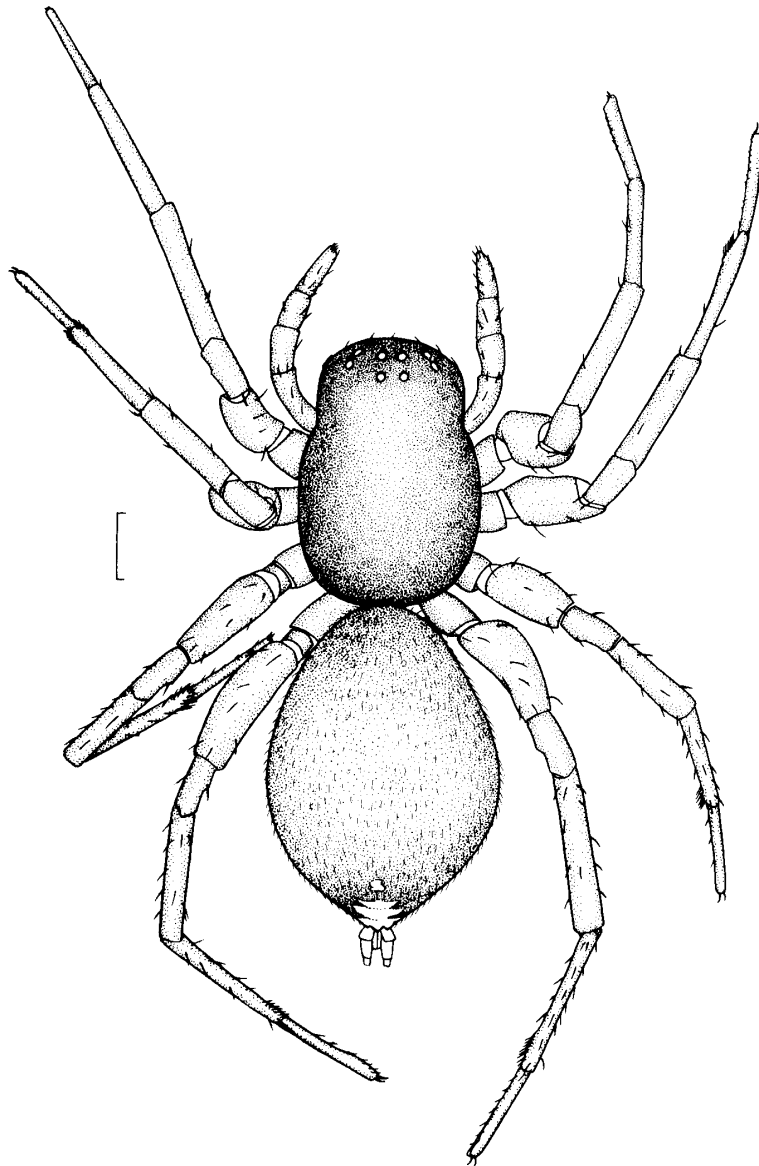
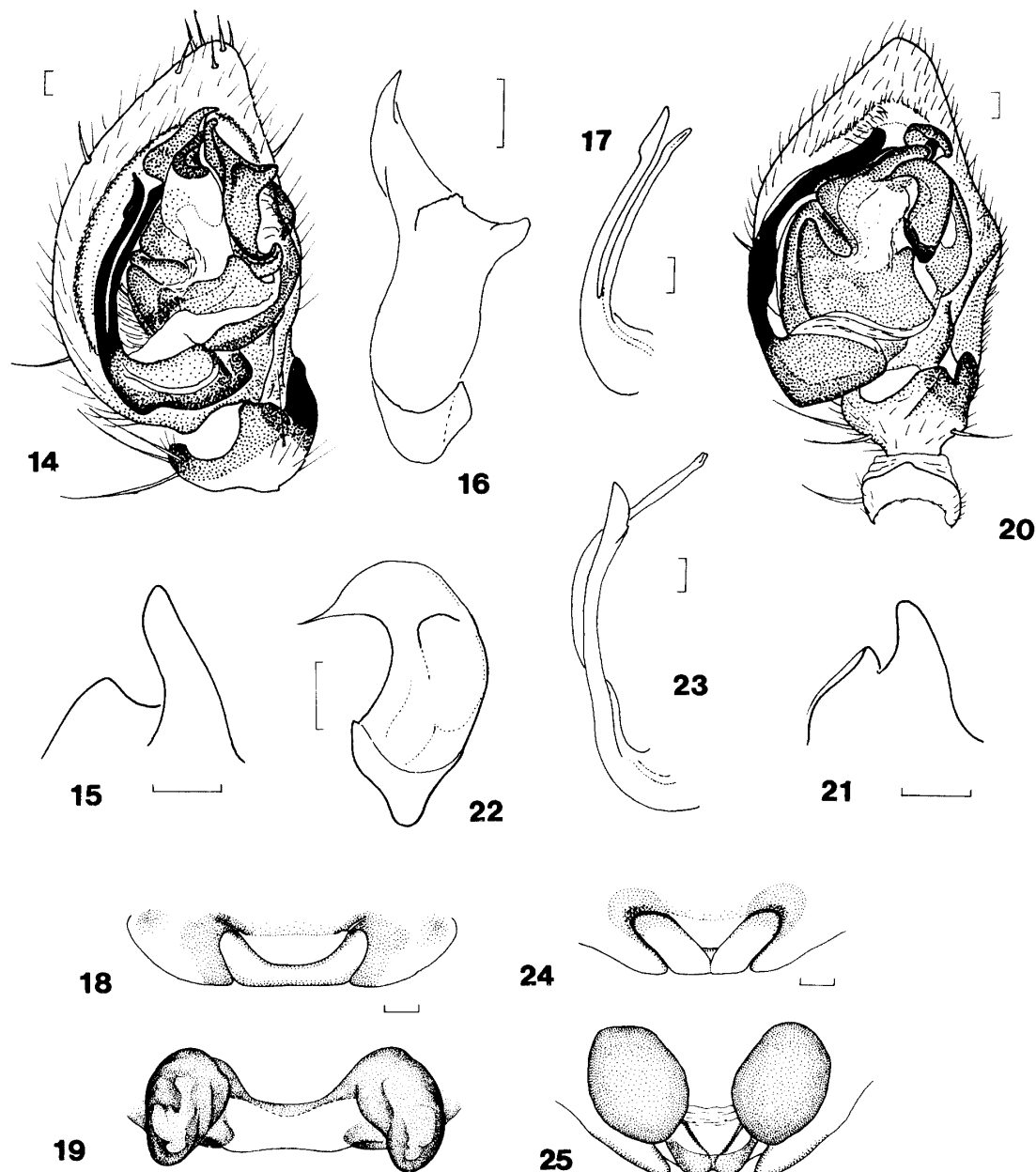


Fig. 13. *Langbiana fulvipes* sp. nov., habitus of female. (Scale: 1 mm.)

1.41), II 7.45 (2.10+0.98+1.58+1.55+1.24), III 7.59 (2.01+1.00+1.45+2.03+1.10), IV 10.11 (2.58+1.02+2.10+2.93+1.48), ♂ I 9.41 (2.54+0.98+2.05+2.13+1.71), II 8.11 (2.29+0.98+1.64+1.86+1.34), III 7.82 (2.13+0.96+1.50+2.08+1.15), IV 10.66 (2.78+1.00+2.28+3.10+1.50).

Eyes: ALE/AME ♀ 0.93-1.08, ♂ 0.73-0.87, ♀ PME/AME 0.77-1.00, ♂ 0.73-0.87, PLE/AME ♀ 0.77-1.04, ♂ 0.79-0.93, AME-AME/AME-ALE ♀ 0.42-0.67, ♂ 0.57-0.80, PME-PME/PME-PLA ♀ 0.29-0.39, ♂ 0.21-0.41, MOA length/width ♀ 1.09-1.18, ♂ 1.06-1.13, anterior width / posterior width ♀ 0.97-1.06, ♂ 1.03-1.10. Labium length/width ♀ 0.91-1.09, ♂ 0.94-1.03, sternum length/width ♀ 1.06-1.10, ♂ 1.09-1.14.

Male palp (Figs. 14-17). Retrolateral tibial apophysis digitiform (Fig. 15); median apophysis long, the tip simple (Fig. 16), embolus with developed embolic apophysis slightly



Figs. 14-25. 14-19, *Langbiana fulvipes* sp. nov.; 20-25, *L. shimojanai* sp. nov. — 14 & 20, Male palps, ventral view; 15 & 21, retrolateral tibial apophyses; 16 & 22, median apophyses; 17 & 23, emboli; 18 & 24, epigyna; 19 & 25, female genitalia, dorsal view. (Scales: 0.1 mm.)

longer than the main duct (Fig. 17).

Female genitalia (Figs. 18-19). Epigynal plate procurved (Fig. 18), spermathecae distant from each other by twice the diameter (Fig. 19).

Coloration and markings (Fig. 13). ♀♂, Prosoma dark brown; chelicerae dark brown, prolaterally yellowish, maxillae yellowish brown, prolaterally darker, labium and sternum brown; legs reddish yellow to reddish brown. Dorsum of opisthosoma dark maroon to

black with small white markings in the posterior part near spinnerets, venter dark maroon with a pair of yellow bands at the sides.

Range. Iriomotejima Island.

Remarks. This new species is closely related to *L. hoosi* but differs from the latter by the structure of male palp and epigynum. They can be readily distinguished from each other by their coloration and the markings on their opisthosomata.

***Langbiana shimojanai* sp. nov.**

(Figs. 20–26)

Type series. Holotype: ♂, allotype ♀, Sonai, Iriomotejima Island, Yaeyama Islands, Southwest Japan, 30-III-1985, A. TANIKAWA leg. (NSMT-Ar 2216–2217). Paratypes: 1 ♀, same locality as for the holotype, 31-III-1987; 1 ♀, Urauchi, Iriomotejima Island, 30-III-1983; 1 ♀, Funaura, Iriomotejima Island, 13-VIII-1985; all the paratypes collected by A. Tanikawa (NSMT-Ar 2218–2220).

Description. Measurements (in mm). Body length ♀ 5.27–5.80, ♂ 4.80; prosoma length ♀ 2.20–2.55, ♂ 2.57, width ♀ 1.70–1.78, ♂ 1.97; opisthosoma length ♀ 2.60–3.13, ♂ 2.20, width ♀ 1.77–2.13, ♂ 1.35; lengths of legs of the holotype (♂) and 1 ♀ paratype from Sonai [total length (femur + patella + tibia + metatarsus + tarsus)]: ♀ I 5.96 (1.67+0.65+1.37+1.42+0.85), II 5.76 (1.57+0.65+1.20+1.32+1.02), III 5.90 (1.57+0.65+1.20+1.55+0.93), IV 7.80 (1.91+0.70+1.70+2.25+1.24), ♂ I 8.05 (2.10+0.70+1.80+2.04+1.41), II 7.44 (2.00+0.73+1.58+1.85+1.28), III 7.36 (1.95+0.73+1.55+2.03+1.10), IV 9.48 (2.33+0.73+2.10+2.87+1.45).

Eyes: ALE/AME ♀ 1.00–1.25, ♂ 0.92, PME/AME ♀ 1.00–1.11, ♂ 0.92, PLE/AME ♀ 1.10–1.33, ♂ 0.96, AME-AME/AME-ALE ♀ 0.53–0.62, ♂ 0.80, PME-PME/PME-PLA ♀ 0.40–0.50, ♂ 0.40, MOA length/width ♀ 1.11–1.16, ♂ 1.18, anterior width / posterior width ♀ 0.80–0.88, ♂ 1.00. Labium length/width ♀ 0.86–1.00, ♂ 0.93, sternum length/width ♀ 0.97–0.99, ♂ 1.00.

Male palp (Figs. 20–23). Retrolateral tibial apophysis small (Fig. 21), median apophysis relatively small, distally curved, the tip sharp and pointed (Fig. 22), embolus long, the main duct much longer than embolic apophysis (Fig. 23).

Female genitalia (Figs. 24–25). Epigynal plate separated into two parts (Fig. 24), spermathecae long, distally expanded, globular in dorsal view (Fig. 25).

Coloration and markings (Fig. 26). ♀♂, Prosoma dark brown; chelicerae brown, prolaterally lighter, maxillae yellowish brown, labium and sternum brown. Legs: coxa pale yellow, trochanter yellowish brown, femora proximally pale yellow, distally dark brown, the other parts of legs brown. Dorsum of opisthosoma dark brown with three pairs of white spots and a white bar, venter yellowish brown.

Range. Iriomotejima Island.

Remarks. *Langbiana shimojanai* resembles *L. albomaculata* BOSMANS et HILLYARD, 1990, recently described from Sulawesi, Indonesia, but is distinguishable from the latter by the structure of male palp and female genitalia.

This new species is named after Mr. Matsuei SHIMOJANA, Okinawa, who made efforts to study the spiders in the Ryukyu Islands.

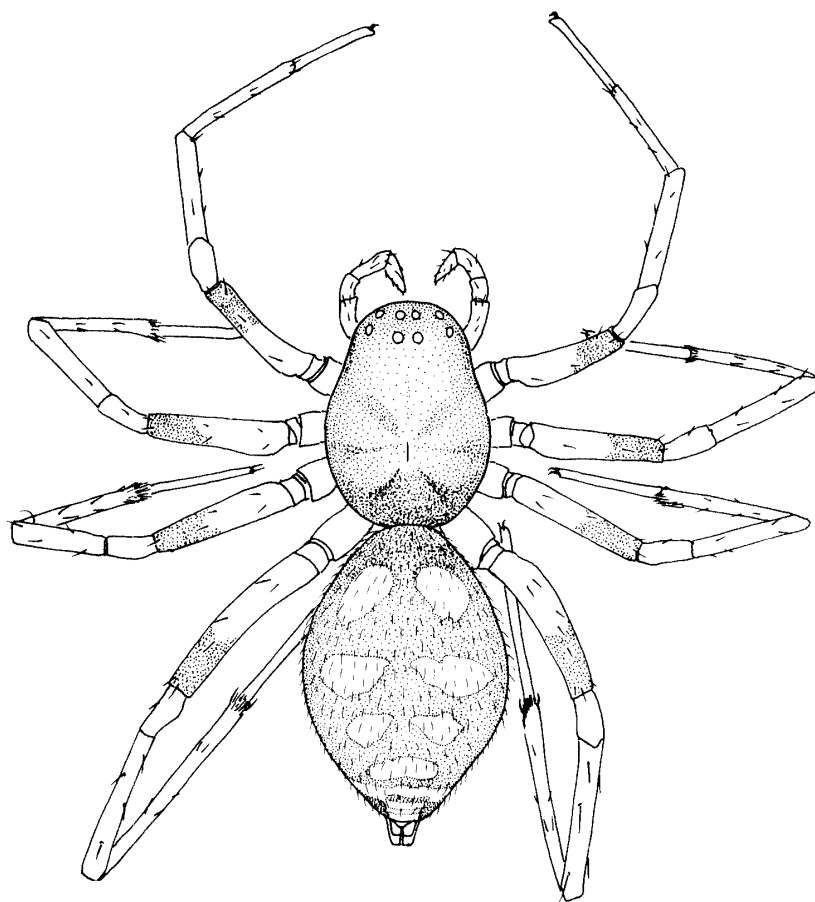


Fig. 26. *Langbiana shimojanai* sp. nov., habitus of female. (Scale: 1 mm.)

要 約

ホウシグモ科 (Zodariidae) は特異な形態をした好アリ性クモ類の一群で、世界からおよそ 300 種が知られている。そのうちの約 130 種は、*Storena* 属 (ホウシグモ属) のもとに記載されてきたが、最近この属を検討した BOSMANS と VAN HOVE (1986) は、従来 *Storena* 属とされてきた種のほとんどを、今日までほとんど知られていなかった *Langbiana* 属に転属した。

日本産の *Storena* は、*S. hoosi* KISHIDA (ホウシグモ) ただ 1 種が鹿児島県より記載されていたにすぎず、しかもその基準標本は失われてしまったので、今日まで未検討であった。また、この種のほかに琉球列島に数種の未記載種が生息していることが以前から知られていた。

今回、奄美諸島・トカラ列島の自然史科学的総合研究による調査で、奄美大島の湯湾岳山頂付近より興味深いホウシグモの一種が採集された。この材料に、八重山諸島西表島で採集された標本、また九州の鹿児島県および宮崎県から得られた新しい材料を加え、日本産ホウシグモ属 (*Langbiana*) のクモ類の現時点での検討を行ったので、その結果を報告した。

Storena hoosi は、原著者による基準産地が鹿児島県としか記されていなかったが、鹿児島県霧島産の雌を新基準標本に指定し、再記載を行った。また奄美大島および西表島産の 3 新種を、*Langbiana sadamotoi* (アマミホウシグモ)、*L. fulvipes* (ヒアシホウシグモ)、*L. shimojanai* (ヤエヤマホウシグモ) と命名した。

モ)と命名して記載した。

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